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Project Lead The Way

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"WE'RE NO. 1!" THAT auspicious ranking is always a source of pride when Hoosiers talk about their favorite sports team. But there's another No. 1 ranking that some Indiana teachers, students and potential employers can take to heart. Indiana has more high schools involved in Project Lead The Way, an innovative, hands-on curriculum to get kids interested in engineering careers, than any other state in the country.

The PLTW approach is called activities-based learning, project- based learning, and problem-based learning - or APPB, which has been shown to increase student motivation, cooperative learning skills, higher-order thinking, and improve student achievement. Because Project Lead The Way is engaging for the students, they are more apt to put in extra work that they think is important.

A "Pathway to Engineering" program is offered to high school students and a "Gateway to Technology" program to middle school students. High school courses include introduction to engineering, digital electronics, principles of engineering, computer integrated manufacturing, engineering design and development, civil engineering and architecture, aerospace engineering and bio-technical engineering.

The first step in the process is training the teachers who will teach the curriculum. Two weeks of intensive training on the Purdue University campus is required for each pre engineering course taught.

In Indiana, Purdue has conducted the teacher training since the inception. Its PLTW office is located on the Kokomo campus.

Kokomo High School was the first in the state to try out the program in 2000 with about 30 students. Today there are nearly 175 students enrolled, says James Little, director of the Kokomo Area Career Center. Five pre-engineering courses are offered now and if students meet all requirements they can enroll in the Purdue College of Technology with 12 college credits. With the addition of aerospace, civil engineering and architecture this fall, the college credits can increase to 18.

O'Hair says Indiana surpassed New York, the program's founding state, in 2007 with the most schools in the program, as 232 schools (up from 165 in 2006) helped some 12,000 students. He estimates that 292 schools will be signed up in the fall, pulling well away from any competition. There are many reasons for the stellar showing, he says, but the most important is the cooperation and partnership with Purdue, the Department of Public Instruction and the Department of Workforce Development.

The Department of Workforce Development has played a valuable part in the development of the PLTW program through its funding. "We have invested more than $6 million in the last eight years to help schools offset the costs of teacher training, computers and other needed equipment, materials and supplies," says Terri Schulz, leader of program innovation. But it also has pushed for a PLTW biomedical course in 15 Indiana high schools this year.

Principles of Biomedical Sciences revolves around the fictitious death of a woman, Schulz explains. Students discuss all the things that could have contributed to it kind of a CSI exercise. "The kids love it." Only 40 schools in the nation are testing this first course, so Indiana's involvement is impressive. DWD awarded a $25,000 grant to participating schools. The program will help prepare students for a wide variety of careers including physician, nurse, veterinarian, scientific and pharmaceutical researcher, therapist and technician. Schulz is gearing up for 50 schools to become involved in the program next year.

Newly participating schools will offer the introductory course; others will add the second course, Human Body Systems.

The original pre-engineering PLTW program came as a result of occupational demand, Schulz notes. Development of the biomedical course was driven by student interest as well. In pre-engineering, the classes are made up of 75 to 80 percent boys, she says, while in the biomedical course that's reversed.

The curriculum for the first biomedical course and the three others that will roll out later was developed with heavy Indiana involvement too, says Schulz, and Indiana offers one of only two training sites in the country at Indiana University-Purdue University Indianapolis. The other is at the Rochester Institute of Technology. Thelead teachers for the course in Indiana are Marva Moore, science department chair at Hamilton Southeastern Schools, and Jean K. Schick, Bloomington High School North science department chair and Monroe County Community School Corp. science coordinator. They also helped develop the national curriculum.

The teacher training was fun, rigorous, and a great networking opportunity, says Schick. "Teachers left with an understanding of the philosophy of the program, completed and practiced student assignments and inquiries, and became aware of content that they may need to beef up on." The biomedical field is interdisciplinary with a need for the teacher to be knowledgeable in biology, chemistry and physics, she says. While she is licensed in all three areas, most teachers are licensed in one or two.

Fifty-eight students enrolled in the first pilot course at Bloomington High School, says Schick, and the reaction has been positive. Teachers don't lecture, but rather set the stage for students to engage in an inquiry investigation using Internet resources, reference books, local experts, the lab and building activities, guided by key questions.

Bloomington offers a great deal of community support, says Schick, and she has tapped into it for an advisory board for the new program. "The Bloomington Life Sciences Partnership, Bloomington Economic Development Council and our local universities - Ivy Tech and Indiana University, are wonderful resources and networks."

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